Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –I Examination Feb. - 2012

Subject code: 712803N **Date: 17/02/2012**

Subject Name: Production Automation & CNC Technology

Time: 10.30 am – 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define various automation and discuss the various types of automation. Give atleast one example of each.	**07**
	(b)	Make a case study of implementing the automation system in casting industries.	**07**
Q.2	**(a)**	Discuss the various CNC control systems with example.	**07**
	(b)	Explain the open loop control system and closed loop control system.	**07**
		OR	
	(b)	Give comparison between absolute and incremental co-ordinate system.	**07**
Q.3	**(a)**	Enlist the various input media of NC machine and explain any one of them in detail.	**07**
	(b)	Explain various tape programming formats.	**07**
		OR	
Q.3	**(a)**	Define interpolators. Describe the flow chart of software DDA interpolator for Linear interpolator and Circular interpolator.	**07**
	(b)	Explain the Geometric, Motion and Post processor statements in APT.	**07**
Q.4	**(a)**	Explain Canned drilling cycle.	**07**
	(b)	What do you mean by Adaptive control? Discuss the Adaptive Controls Optimisation (ACO) system diagram for turning centre.	**07**
		OR	
Q.4	**(a)**	Explain Double nut pre-loading method and Single nut pre-loading methods of ball-screw nut.	**07**
	(b)	Discuss the comparison between manual and computer aided part programming.	**07**
Q.5	**(a)**	Write a manual part programme for finishing a forged component as shown in fig. 2. The speed and feed on the turning centre are 200 rpm and 0.35 mm/rev. Assume 1 mm material is to be removed radially from external diameter.	**07**
	(b)	Write a complete a part program for machining the forged component as shown in fig. 1	**07**
		OR	
Q.5	**(a)**	Write a complete APT part programme to turn a shaft as shown in fig. 3. The post processor call statement is MACHINE/CAST, 1. The tool used has a nose radius of 3mm. Assume spindle speed as 300 rpm and feed for machining as 0.3 mm/rev.	**10**
	(b)	Shot note on level of automation.	**04**

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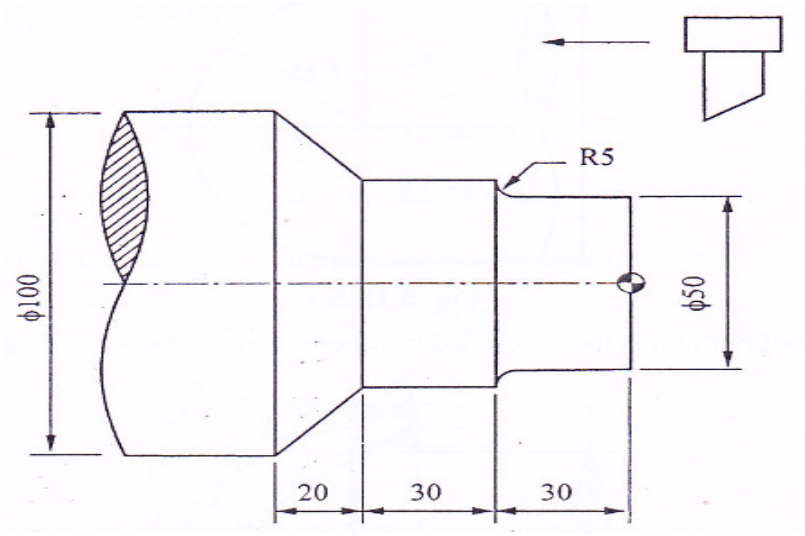

Fig. 1

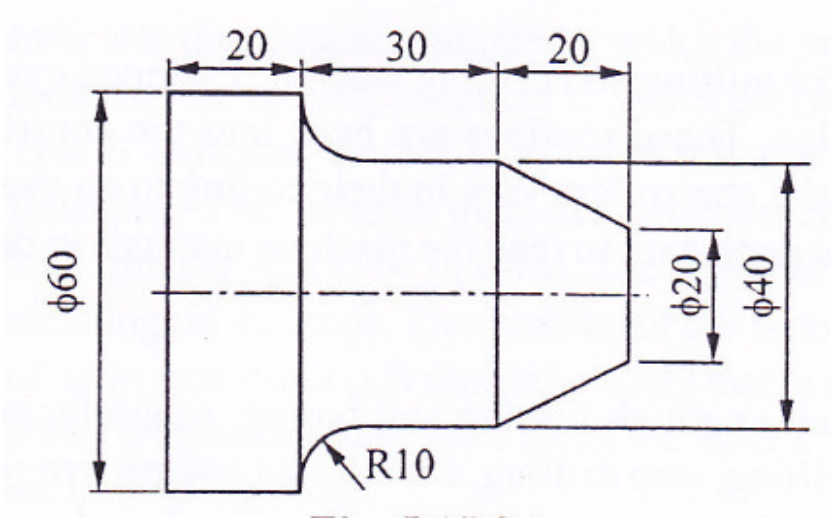

Fig. 2

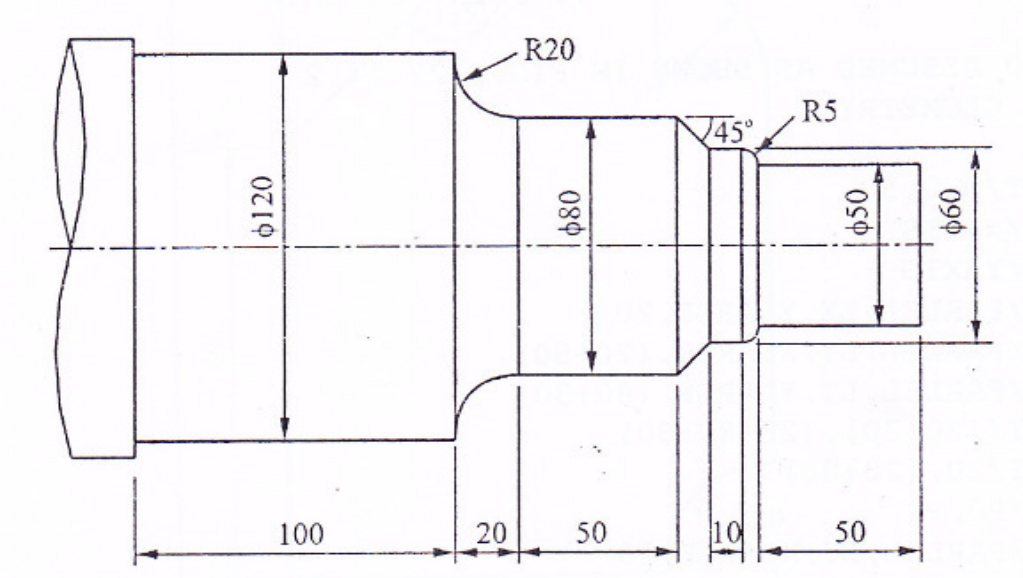

Fig. 3